

Original Article

SEROEPIDEMIOLOGY OF HIV IN MOYAMBA DISTRICT, SIERRA LEONE, 2013-2016

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ABSTRACT

HIV infection is one of the health problems plaguing resource-poor countries. There are limited data on the prevalence in remote towns and districts. In this study, we aimed at investigating the seroprevalence of HIV in Moyamba District using data from voluntary counseling and testing(VCT), prevention of mother-to-child transmission of HIV(PMCT) and from blood donors from 2013 to 2016.

The seroprevalence of HIV from VCT was 2.87%(357/12434) for the four years, 2013 to 2016. Seroprevalence from PMCT was 0.91%(153/16,745) while the prevalence from healthy blood donors was 1.53%(27/1756). Overall, 537 persons tested positive for HIV out of 30,935 persons tested in Moyamba from 2013 to 2016 with a prevalence of 1.74(95%CI:1.6-1.89%).

Statistically, our result is significantly different from the results of the DHS where HIV seroprevalence was reported at 1.0% in Moyamba(P<0.001).

Our result provides an update on the HIV situation in Moyamba and shows an epidemic that is consistent with the national seroprevalence of 1.5%.

Keywords: Sero-epidemiology, HIV, VCT, PMCT, Blood donors

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BACKGROUND

In Sierra Leone, the first reports of HIV were in 1987 (NAS/MOHS 2002). The country then had about 11 years of civil war from 1991 to 2002. The war was characterized by massive displacement of people, rape, high level of prostitution that seemed to accelerate the HIV prevalence (Human Rights Watch 2003).

Serious countrywide interventions against HIV commenced in the year 2002, when Sierra Leone had the first national HIV seroprevalence (NAS/MOHS 2002) and also established the prevention of mother-to-child transmission (PMCT) policy that required all pregnant women to be tested for HIV (<http://www.nas.gov.sl/interventions/pmtct>, accessed, 9/12/16). Voluntary counseling and testing (VCT) and screening of blood products for HIV had been instituted earlier.

However, about 49% of women and 82% of men are yet to be tested for HIV (NAS/MOHS 2015). The low level of HIV testing has been associated with stigma and lack of appropriate understanding about HIV (Bhoobun et al., 2014, Kelly, Weiser, & Tsai, 2016).

Population-based surveys were carried out in 2008 and 2013 reporting the national HIV prevalence to be stabilized and at 1.5% seroprevalence (Statistics Sierra Leone and ICF International 2014). And the epidemic currently affects over 50,000 persons including about 2166 new infections and there are about 23,000 orphans due to the HIV problem in Sierra Leone (WHO 2016).

In Moyamba, the site of this study, apart from the DHS reports, there is a paucity of data on HIV epidemic. A peek into the HIV situation in Moyamba

district was observed during the Ebola outbreak, when several suspected EVD patients were diagnosed with HIV and posed challenges in EVD treatment (Arranz et al, 2016).

Screening for HIV using established programmes such as the VCT, PMCT and blood donor screening are important for determining the HIV situation in a remote population such as Moyamba.

The goal of this study was to determine the seroprevalence of HIV in Moyamba from healthy blood donors, VCT and PMCT cases from 2013 to October 2016.

Methods

The study was carried out in the Moyamba District which is one of four districts in Southern Sierra Leone and has a land area of The study was carried out in the Moyamba District which is one of four districts in Southern Sierra Leone and has a land area of 6902km². The land is divided into 14 chiefdoms which are further divided into 143 sections, and a total of 1617 communities (DOtW and MdM 2015). The population of Moyamba is reported at 318,064 persons (Statistics Sierra Leone 2016), 70% of which live in poverty (DOtW and MdM 2015).

We analyzed data collected from VCT, PMCT and blood donors at the Moyamba Hospital from the year 2013 to 2016. The data was collated from hospital records. The HIV results were from HIV tests done using rapid diagnostic tests comprised of a

Determine HIV kit Determine™ HIV-1/2 (Alere Medical Co Ltd. Matsudo-shi, Chiba, Japan), a positive test was confirmed by the SD Bioline HIV1/2 test kit ((Standard Diagnostics Inc. Kyonggi-do, Korea). In the event of a tie, the Uni-Gold HIV kit (Trinity Biotech, Ireland) was used. For blood donation, subjects were to have Hb values =12g/dL.

The study was a requirement for the undergraduate degree in Biological Sciences at the Njala University, by the lead author(AV). Statistical analyses were done using the online statistical software package Vassar stats (<http://vassarstats.net/>). The computations involved percentages, chi-

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Table 1.0: VCT in Moyamba, 2013-2016

YEAR	MT	MP	%P	FT	FP	%P	TT	TP	%P	P-Value
2013	2187	37	1.69	3686	133	3.6	5873	170	2.89	0.0001
2014	1512	45	2.98	1995	61	3.06	3507	106	3.02	0.89
2015	650	15	2.31	1340	53	3.96	1990	68	3.42	0.06
2016	440	6	1.36	624	7	1.12	1064	13	1.22	0.72
Total	4789	103	2.15	7645	254	3.32	12434	357	2.87	0.0001

MT (males tested), MP (males positive), FT (females tested), FP (Females positive), TT (total tested), TP (total positive) %P (% prevalence)

Seroprevalence of HIV from PMCT, 2013 to 2016

For the period covered by the study, 2013 to 2016, 16,745 women were tested by PMCT in Moyamba and 153(0.91%) were positive for HIV (Table 2). There was a significant difference between prevalence in 2015 and 2014(P=0.001) and also between the rates in 2015 and 2013(P=0.01).

Table 2: PMCT in Moyamba, 2013-2016

YEAR	PMCT	WP	%P	P-value
2013	2157	27	1.25	
2014	3576	47	1.31	0.84
2015	6011	40	0.66	0.001
2016	5001	39	0.77	0.48
TOTAL	16,745	153	0.91	

Seroprevalence of HIV from Healthy Blood Donors, 2013-2016 The seroprevalence from healthy blood donors at the Moyamba Government Hospital were also assessed. The seroprevalence was 2.61% in 2013; 0.66% in 2014, 1.33% in 2015 and 1.28% in 2016(Table 3). The overall seroprevalence for the four-year period was 1.53%(27/1756). There was no significant difference in prevalence by sex.

Table 3: Prevalence of HIV in Blood Donors

YEAR	MP	FT	%P	FT	FP	%P	TT	TP	%P
2013	423	11	2.6	36	1	2.77	459	12	2.61
2014	276	2	0.72	27	0	0	303	2	0.66
2015	412	4	0.97	36	2	5.55	448	6	1.33
2016	516	7	1.35	30	0	0	546	7	1.28
TOTAL	1627	24	1.47	129	3	2.32	1,756	27	1.53

Discussions

The seroprevalence of HIV from the three data sources ranged from a minimum of 0.66% to 3.42%. When data from VCT, PMCT and blood donors and put together, 537 persons tested positive for HIV out of 30,935 persons tested in Moyamba from 2013 to 2016 with a prevalence of 1.74(95%CI:1.6-1.89%).

Statistically, our result is significantly different from the results of the DHS where HIV seroprevalence was reported at 1.0% in Moyamba(P<0.001), however our result is not significantly different from the national seroprevalence rate of 1.5%(Statistics Sierra Leone and ICF International 2014).

Our PMCT rates reported is under 1% just like the one reported by Kouyoumdjian *et al.*, (2008) of 0.58%(7/1208) among women seeking antenatal care in Kenema District.

The prevalence among blood donors, who are healthy volunteers seemed to match with the 1.5% stabilized epidemic described earlier (NAS/MOHS 2015).

VCT prevalence was expected to be higher than the PMCT and blood donor HIV prevalence. Many VCT clients normally opt for an HIV tests after potential exposures to the virus.

Our study had several limitations. First, we used data collected and entered into hospital records, we did not generate the data primarily and could not ascertain whether the test kits were stored at the right temperature as described by their

inserts or if the tests were done within the specified time indicated in the user inserts. We do however know that the tests were performed by trained and qualified technicians who could have performed according to the guidelines by the Sierra Leone Ministry of Health and Sanitation.

Additionally, we were unable to use age metadata because the data did not have age for all datasets.

Conclusions

Our result provides an update on the HIV situation in Moyamba and shows an epidemic that is consistent with the national seroprevalence of 1.5%. Our findings from PMCT, VCT and blood donors relate with recent international calls for HIV surveillance(Supervie and Costagliola 2016; UNAIDS 2014; van Sighem *et al.* 2015).

Further research on HIV using a randomized study design with healthy volunteers in a longitudinal cohort could help to determine the incidence of the disease in Moyamba.

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